FIG. 1

```
                                               LIM 1
P  MLLEAELDCHRERPGAPGASALCTFSRTP-  WEGRPQELGGKEIPLCAGCDQHILDRFILKALDRHWHSKCLKCSDCHTPLAER
M  MLLE*****-*RVRAGSEKAAELCPFPRSP-  --M-----------------------------------V-------------
C  MLLE*****-*RVRTGTQKSS-SP-        ---N-----V-------------------------------Q---Q-----K
X  MLLE*****-*RVRTGTQKSSDMCGYT-SP-  ---N-----V-----------------N-----------QTQ-----K
N  MLLE*****-*HPGSSCQNAGNYTRYSSSQD-V ---N-----V-----------------V-----------QSQ----DK

                                   LIM2
P  CFSRGESLYCKDDFEKRFGTKCAACQLGIPPTQVVRRAQDFVYHLHCFACVVCKRQLATGDEFYLMEDSRL
M  -----V------------------------------------------------------I---------
C  ----DGV----E-------------Q---------------------------------I---------
X  ----D-V------------------QQ---------E----------------------I---------
N  ----D-V------------------Q-----------------------------------I-------

                   HOMEODOMAIN
P  VCKADYETAKQREAEATAKRPRTTITAKQLETLKSAYNTSPKPARHVREQLSSETGLDMRVVQVWFQNRRA
M  -----S---------------------------------------N-----N----------------
C  -----S---------------------------------------N-----N----------------
X  -----S---------------------------------------N-----N-------T--------
N  -----S---------------------------------------N-----N----------------

P  KEKRLKKDAGRQRWGQYFRNMKRARGGSKSDKDSVQEEGQDSDAEVSFTDEPSMAEMGPANGLYGGLGEPA
M  -----S----S-----------------------I-----*------------D---------SS-----
C  -----S----T------------------I----I-P-------------------S--SHS--I--SN-S-AS
X  -----S----N------------------I----I-P-------------------S--NHS--I--NS-NDSS
N  -----S----T------------------T----T-D-M-----------------SDL-HS--I--SS-S-SS

P  PALGRPSGAPGSFPLEHGG*LAGPEQYGELRPSSPYGVPSSPAALQSLPGPQPLLSSLVYPEAGLGLV*PA
M  ---V-GL----T-D--T---R------G----I---P----------------------DTN-S---*-S
C  --QA-TN----S-D-S-*IP-QD--SN----I---Q-----S---A---H----------IM*GQ
X  --QA-SN-P-S-----*IPTQD--HN--SN--I---Q-----S---M---H-S-------IIGQ*
N  --QG-NHPA--------AIIPSQ-P-HDIQA------SL---Q---GP---P---RH-----S--PMAGQS

P  GPPGGPPPMRVL*AGNGPSSDLSTGSSGGYPDFPASPASWLDEVDHAQF
M  ----*-----------E--S----------
C  -GQ-V-QS-----*----------
X  GGQ-VA-T-----I*GV------------V---
N  -GQDMT-GV--MMA--------T---
```

FIG. 2

FIG. 3Ai

PIG αGSU PROMOTER

-1059   ÷36   LUCIFERASE

CONTROL

pLhx3

ΔLIM pLhx3

0   500   1000   1500   2000
LUCIFERASE ACTIVITY/μg PROTEIN x10^{-2}

FIG. 3Aii

FIG. 3Bi

MOUSE αGSU PROMOTER

-507   +46   LUCIFERASE

CONTROL

pLhx3

ΔLIM pLhx3

0   1000   2000   3000   4000
LUCIFERASE ACTIVITY/μg PROTEIN

FIG. 3Bii

CONTROL   pLhx3

-50.9 kDa

-34 kDa

FIG. 3C

FIG. 4B

FIG. 4A

FIG. 5A

PROLACTIN
ENHANCER/PROMOTER

```
        ┌──────────────/ /──────────┬──────────┐
────────┤ :::::::::::::/ /::::::::::: │LUCIFERASE├────────
        └──────────────/ /──────────┴──────────┘
     -1831        -1539 -422        +33
```
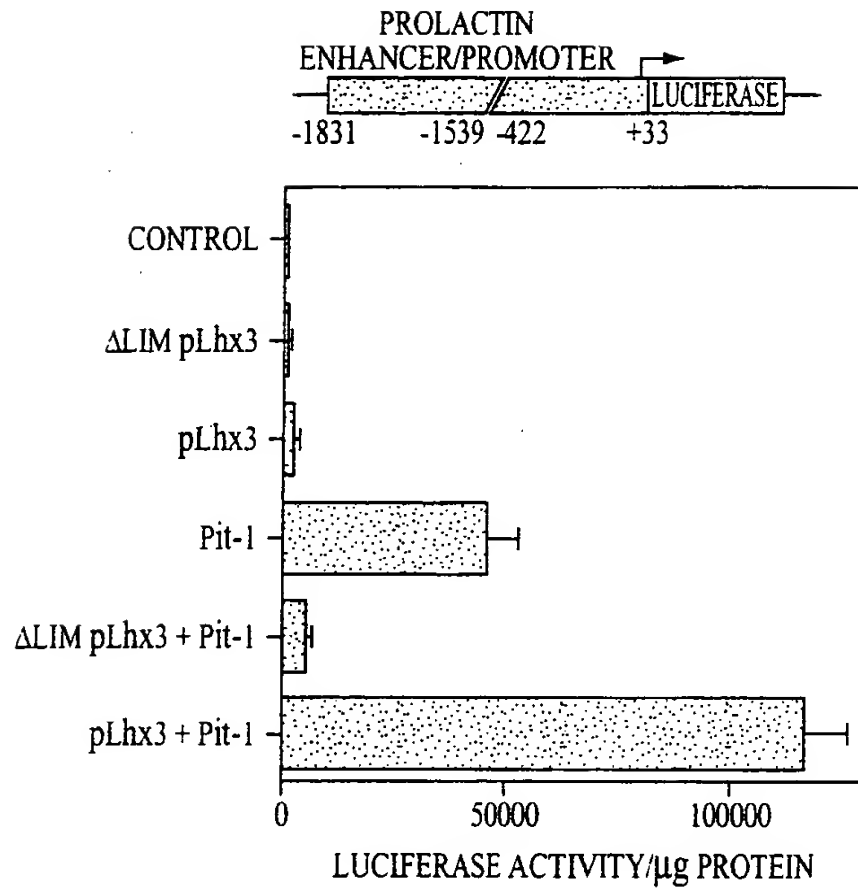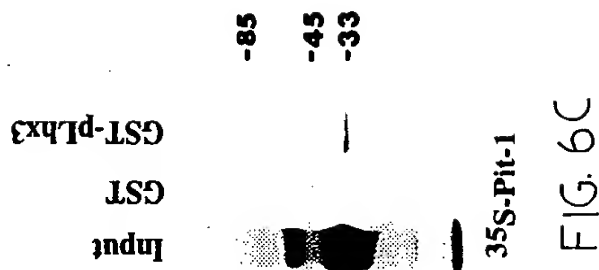

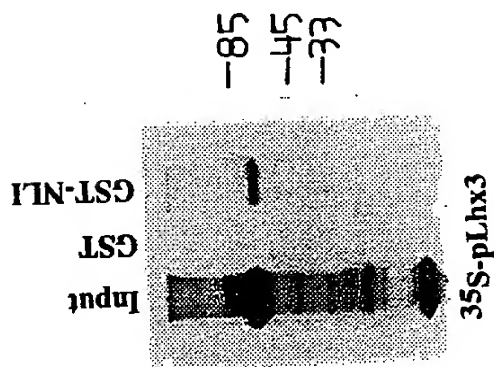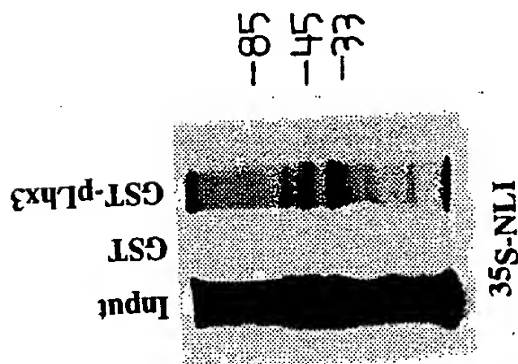LUCIFERASE ACTIVITY/μg PROTEIN

FIG. 5B

FIG. 6A

FIG. 6B

FIG. 6C

FIG. 7A

```
   1 ctggggagggg cggccacagg agctgggagg aaaagagatc ccactgtgtg ccggctgcga
  61 ccagcacatc ctggaccgct tcatcctcaa ggctctggac cgccactggc acagcaagtg
 121 cctcaagtgc agtgactgcc acacgccgct ggccgagcgc tgcttcagcc gcggagagag
 181 cctctactgc aaggacgact tcttcaagcg cttcgggacc aagtgcgccg cgtgccagct
 241 gggcatcccg cccacgcagg tggtgcgccg cgcccaggac ttcgtgtacc acctgcactg
 301 cttcgcctgc gtcgtgtgca agcggcagct ggccacgggc gacgagttct acctcatgga
 361 ggacagccgg ctcgtgtgca aggccgacta cgagaccgcc aagcagccgag aggccgaggc
 421 cacggccaag cggccgcgca cgaccatcac ggccaagcag ctggagacgc tgaagagcgc
 481 ctacaacacg tcgcccaagc ccgcgccgcca cgtgcgcgag cagctctcct ccgagaccgg
 541 cctggacatg cgcgtcgtgc aggtgtggtt ccagaaccgc cgggccaagg aaaagcggct
 601 caagaaggac gccggccggc agcgctgggg ccagtacttt cgtaacatga agcgcgcccg
 661 cggtggctcc aagtcggaca aggacagcgt ccaggaggag gggcaggaca gtgacgccga
 721 ggtctccttc acagacgagc catccatggc cgaaatgggc cctgccaacg gcctctacgg
 781 cggcctgggg gagcgcacgg gaggcctgg cgggcccgga ccggccctcg gggccccgg gcagcttccc
 841 gctggagcac ggaggcctgg cgggcccgga gcagtatgga gagctgcgcc ccagcagccc
 901 ctacggtgtc ccctcgtcgc ccgcgccct gcagagcctc cctggccccc agcccctcct
 961 ctccagcttg gtgtaccgg aggctggctt ggggcttgtg ccgcgggggc cccagtggg
1021 gccccaccc atgagggtgc tggcagggaa cggaccccagc tccgacctat ccacgggggag
```

FIG. 7B

```
1081 cagtggggggc tacccgact tccctgccag tcccgcctcc tggctggacg aggtggatca
1141 cgctcagttc tgactgaggc cccagctccg tggagcacca gacacgagca ctgcccctgg
1201 ctgggtggtc gggagccgcg ctctcctttc ccgaagccct gggcctctaa aggacacagg
1261 gtcaccggcg gggcacaggc tgaggactgt ccagccccggc ggccctggcc ccgggcagag
1321 ggactttctc ccggtctcga ggctcccttct gggacaaggg gagccacctg gtggctgctc
1381 agcaagcctt gtttgtaag cagattcctc cctttatcaa ccaaaattaa ctgagtgctt
1441 gctgctcttt ctagaccgga gtggtcagcc cccgaagccg gggaggggg ctctccccag
1501 cccagagcag cacagccctc agactggaag atgctttaat tttaaaaatt aaaaaataat
1561 acgaactgtg cttccatttc ccagcttcct ctgtctagtt ctgcc
```

FIG.8

WEGRPQELGGKEIPLCAGCDQHILDRFILKALDRHWHSKCLKCSDCHTPLAERCFS

RGESLYCKDDFFKRFGTKCAACQLGIPPTQVVRRAQDFVYHLHCFACVVCKRQLAT

GDEFYLMEDSRLVCKADYETAKQREAEATAKRPRTTITAKQLETLKSAYNTSPKPA

RHVREQLSSETGLDMRVVQWFQNRRAKEKRLKKDAGRQRWGQYFRNMKRARGGSK

SDKDSVQEEGQDSDAEVSFTDEPSMAEMGPANGLYGGLGEPAPALGRPSGAPGSFP

LEHGGLAGPEQYGELRPSSSPYGVPSSSPAALQSLPGPQPLLSSLVYPEAGLGLVPAG
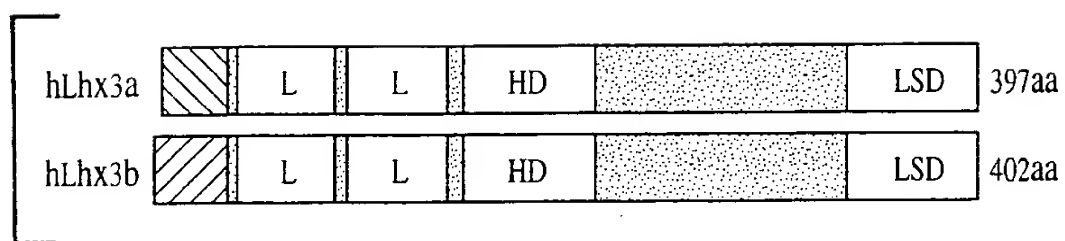
PPGGPPPMRVLAGNGPSSSDLSTGSSGGYPDFPASPASWLDEVDHAQF

Fig. 9A

FIG.9B

```
Ha   1  MLLETGLERDRARPGA--A-AVCTLGGTR 26
Ma   1  ....AE.DCH.E....PG.S.L..FSR.P 29

Hb   1  MEARGELGPARESAGGDLLLALLARRADLRR 31
Mb   1  .......D.S................... 31

             LIM Domain 1
H   32  EIPLCAGCDQHILDRFILKALDRHWHSKCLKCSDCHTPLAERCFSRGESVYCKDDFFKRFGTK
P   12  ..............................L...............
M   32  ......M.......................V...............

             LIM Domain 2
H   94  CAACQLGIPPTQVVRRAQDFVYHLHCFACVVCKRQLATGDEFYLMEDSRLVCKADYETAKQREAEA
P   74  ....................................................
M   94  ....................................................

             Homeodomain
H  160  TAKRPRTTITAKQLETLKSAYNTSPKPARHVREQLSSETGLDMRVVQVWFQNRRAKEKRLKKDAG
P  140  ....................................................
M  160  ....................................................

H  225  RQRWGQYFRNMKRSRGGSKSDKDSVQ-EGQDSDAEVSFPDEPSLAEMGPANGLYGSLGEPTQALGR
P  205  .........................A.........E.......T...M.......G....AP....
M  225  .........................S.......I-.......T...M.D.......S....AP....

H  290  PSGALGNFSLEHGGLAGPEQYRELRPGSPYGVPPSPAAPQSLPGPQPLLSSLVYPDTSLGLVPSGA
P  271  ...P.S.P..........G...S.....S....L..........EAG....A.P
M  290  .V.G..S.T.D...T.....G...S.....I..............N.S....P

             Lhx3/LIM3-specific domain
H  356  PGGPPPMRVLAGNGPSSDLSTGSSGGYPDFPASPASWLDEVDHAQF* 402
P  337  .............................................* 383
M  356  ....................................E.S......* 402
```
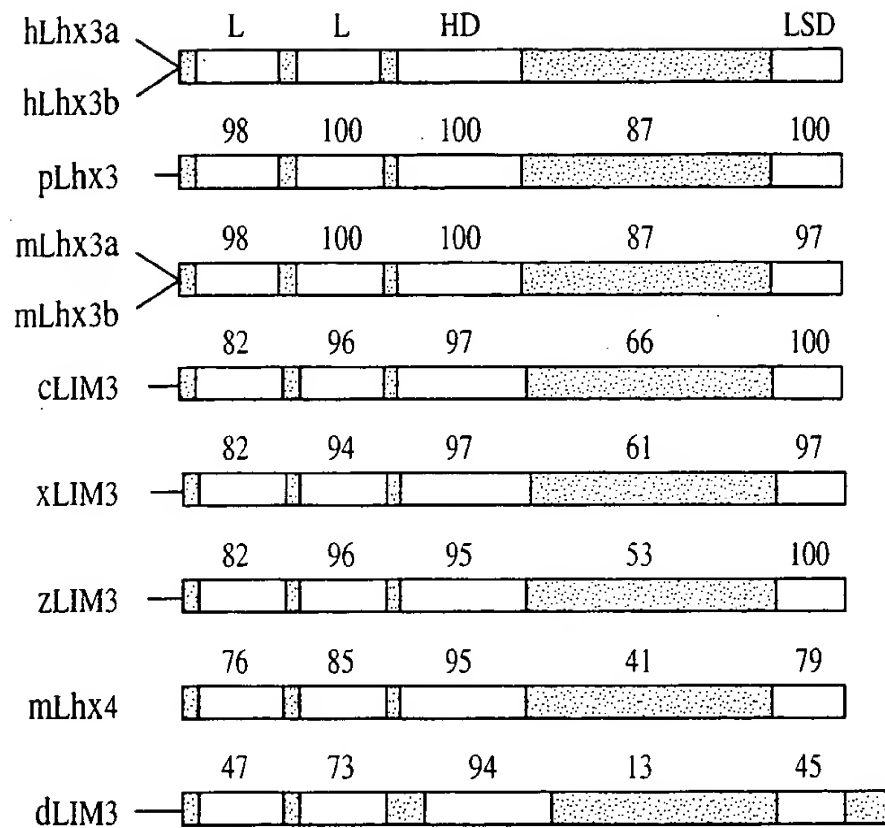
12/52

Fig. 9C

FIG. 10A

```
-104  ggcacgagcc ccgcacgacg cggcgggact tgggagcccc gaaccctcca
 -54  ggggacgctg acctcggagg agcgcgtctc gcgccactcg gcctggtggc
  -4  cgcgATGCTG CTGGAAACGG GGCTCGAGCG CGACCGAGCG AGCCCGGGG
  47  CCGCCGCCGT CTGCACCTTG GGCGGGACTC GG
  79  GAGATCCCGC TGTGCGCTGG CTGTGACCAG CACATCCTGG ACCGCTTCAT
 129  CCTCAAGGCT CTGGACCGCC ACTGGCACAG CAAGTGTCTC AAGTGCAGCG
 179  ACTGCCACAC GCCACTGGCC GAGCGCTGCT TCAGCCGAGG GGAGAGCGTT
 229  TACTGCAAGG ACGACTTTTT CAAGCGCTTC GGGACCAAGT GCGCCGCGTG
 279  CCAGCTGGGC ATCCCGCCCA CGCAGGTGGT GCGCCGCGCC CAGGACTTCG
 329  TGTACCACCT GCACTGCTTT GCCTGCGTCG TGTGCAAGCG GCAGCTGGCC
 379  ACGGGGGACG AGTTCTACCT CATGGAGGAC AGCCGGCTCG TGTGCAAGGC
 429  GGACTACGAA ACCGCCAAGC AGCGAGAGGC CGAGGCCACG GCCAAGCGGC
 479  CGGCGCACGAC CATCACCGCC AAGCCGGCCG GCGCCACGTG CGCGAGCAGC TCTCGTCCGA
 529  AACACCTCGC CCAAGCCGGC GGGCCACGGC GGCGAGCAGC TCTCGTCCGA
 579  GACGGGCCTG GACATGCGCG TGGTGCAGGT TTGGTTCCAG AACCGCGGG
 629  CCAAGGAGAA GAGGCTGAAG AAGGACGCCG GCCGGCAGCG CTGGGGCAG
 679  TATTTCCGCA ACATGAAGCG CTCCCGCGGC GGCTCCAAGT CGGACAAGGA
 729  CAGCGTTCAG GAGGGGCAGG ACAGCGACGC TGAGGTCTCC TTCCCGATG
```

FIG. 10B

```
 779  AGCCTTCCTT GGGGAAAATG GGCCCGGCCA ATGGCCTCTA CGGGAGCTTG
 829  GGGGAACCCA CCCAGGCCTT GGGCCGGCCC TCGGGAGCCC TGGGCAACTT
 879  CTCCCTGGAG CATGGAGGCC TGGCAGGCCC AGAGCAGTAC CGAGAGCTGC
 929  GTCCCGGCAG CCCCTACGGT GTCCCCCCAT CCCCGCCGC CCCGCAGAGC
 979  CTCCCTGGCC CCAGCCCCT CCTCTCCAGC CTGGTGTACC CAGACACCAG
1029  CTTGGGCCTT GTGCCCTCGG GAGCCCCGG CGGCCCCCA CCCATGAGGG
1079  TGCTGGCAGG GAACGGACCC AGTTCTGACC TATCCACGGG GAGCAGCGGG
1129  GGTTACCCCG ACTTCCCTGC CAGCCCCGCC TCCTGGCTGG ATGAGGTAGA
1179  CCACGCTCAG TTCTGAcccca ggccccggctc caccctgcac ctcacacgag
1229  ggagctgccc ctgggtgggc ggctcggggc tgctgggggtt tccgaggaag
1279  tggggccagg gcgtcaaggg agggctggtg ccttcggagc ctcccactgc
1329  cgaccgcaca gctccctctc tggggctga gggacccacc tggccccctcc
1379  tctgacacag ggctggcccg ccaggtggcc tcccagcaag ccagccttt
1429  ttgtaagcaa atttctcccc tttattgacc aattaactga gcacttgctg
1479  ctattttctag acatgaaatg tcaccttgct gaggcccagc ccagcccagc
1529  atagcccgag ggctggaaaa acgctttcat ctctaaaact gagaaatcat
1579  cataattgtg cttcacttc ccaggctcca tgtgtcttgg agccgtcacc
1629  ccgaggctcc ctctttaggt cggagattgg ccttgcctgt cgaggcaaga
```

FIG. 10C

1679 ggctgcagag gcggggacac acctgtgtcc tcctcacccc acccagggcc

1729 cttggtgtcc aggctgcacc cacagatgtc tgttgccaaa cagcctgccc

1779 tccctgccgg agccggctct gccagcccca gattgggaag tctcccgct

1829 ggagaagggt ggggctcctc tgagcctgcc ctgcctcctc catcagatcc

1879 tttgggaaga agtttctggg agatgcccgc agctgtgcgt gcccagaca

1929 caaaggctgg cctgtgtgta agtcaaagtc actcccgcaa acctgaatct

1979 cgagctacct attggttctg tgaatgttct gtgtcttta tttattctcg

2029 ggtgatcagc tctttccaag ctcgtgcc

FIG. 11A

-119 cgcagcgccc agcagcaccc ggagtcgctt ggacgccggt tcggggctat

-69   tgcggggtgg cgtcgctggg cccgggaaag ttcggactg gagagtggcg

-19   acgccggcg gcgggaccca TGGAGGGCGCG CGGGAGCTG GGCCCGGCCC

32   GGGAGTCGGC GGGAGGCGAC CTGCTGCTAG CACTGCTGGC GCGGAGGGCA

82   GACCTGCGCC GA

94   GAGATCCCGC TGTGCGCTGG CTGTGACCAG CACATCCTGG ACCGCTTCAT

144   CCTCAAGGCT CTGGACCGCC ACTGGCACAG CAAGTGTCTC AAGTGCAGCG

194   ACTGCCACAC GCCACTGGCC GAGGCTGCT TCAGCCGGAGG GGAGAGCGTT

FIG. 11B

```
 244  TACTGCAAGG ACGACTTTTT CAAGGCTTTC GGGACCAAGT GCGCCGCGTG
 294  CCAGCTGGGC ATCCCGCCCA CGCAGGTGGT GCGCCGCGCC CAGGACTTCG
 344  TGTACCACCT GCACTGCTTT GCCTGCGTCG TGTGCAAGCG GCAGCTGGCC
 394  ACGGGGGACG AGTTCTACCT CATGGAGGAC AGCCGGCTCG TGTGCAAGGC
 444  GGACTACGAA ACCGCCAAGC AGCGAGAGGC CGAGGCCACG GCCAAGCGGC
 494  CGCGCACGAC CATCACCGCC AAGCAGCTGG AGACGCTGAA GAGGCGTTAC
 544  AACACCTGC CCAAGCCGGC GCGCCACGTG CGCGAGCAGC TCTCGTCCGA
 594  GACGGGCCTG GACATGCGCG TGGTGCAGGT TTGGTTCCAG AACCGCCGGG
 644  CCAAGGAGAA GAGGCTGAAG AAGGACGCCG GCCGGCAGCG CTGGGGCAG
 694  TATTTCCGCA ACATGAAGCG CTCCCGCGGC GGCTCCAAGT CGGACAAGGA
 744  CAGCGTTCAG GAGGGGCAGG ACAGCGACGC TGAGGTCTCC TTCCCGATG
 794  AGCCTTCCTT GGCGGAAATG GGCCCGGCCA ATGGCCTCTA CGGGAGCTTG
 844  GGGGAACCCA CCCAGGCCTT GGGCCGGCCC TCGGGAGCCC TGGGCAACTT
 894  CTCCCTGGAG CATGGAGGCC TGGCAGGCCC AGAGCAGTAC CGAGAGCTGC
 944  GTCCCGGCAG CCCCTACGGT GTCCCCCCAT CCCCGCCGC CCCGCAGAGC
 994  CTCCCTGGCC CCAGCCCCCT CCTCTCCAGC CTGGTGTACC CAGACACCAG
1044  CTTGGGCCTT GTGCCCTCGG GAGCCCCCGG CGGGCCCCCA CCCATGAGGG
1094  TGCTGGCAGG GAACGGACCC AGTTCTGACC TATCCACGGG GAGCAGCGGG
```

FIG. 11C

```
1144 GGTTACCCCG ACTTCCCTGC CAGCCCCGCC TCCTGGCTGG ATGAGGTAGA
1194 CCACGCTCAG TTCTGAccca ggcccggctc caccctgcac ctcacacgag
1244 ggagctgccc ctgggtgggc ggctcggggc tgctgggggtt tccgaggaag
1294 tggggccagg ggcgtcaaggg agggctggtg ccttcggagc ctcccactgc
1344 cgaccgcaca gctccctctc tgggggctga gggacccacc tggcccctcc
1394 tctgacacag ggctgcccg ccaggtggcc tcccagcaag ccagccttttt
1444 ttgtaagcaa atttctcccc tttattgacc aattaactga gcacttgctg
1494 ctatttctag acatgaaatg tcaccttgct gaggcccagc ccagcccagc
1544 atagcccgag ggctggaaaa acgctttcat ctctaaaact gagaaatcat
1594 cataattgtg ctttcacttc ccaggctcca tgtgtcttgg agccgtcacc
1644 ccgaggctcc ctcttaggt cggagattgg ccttgcctgt cgaggcaaga
1694 ggctgcagag gcggggacac acctgtgtcc tcctcacccc accccaggcc
1744 cttggtgtcc aggctgcacc cacagatgtc tgttgccaaa cagcctgccc
1794 tccctgccgg agccggctct gccagcccca gattgggaag tctcccgct
1844 ggagaagggt ggggctcctc tgagcctgcc ctgcctcctc catcagatcc
1894 tttgggaaga agttctggg agatgccccgc agctgtgcgt gccccagaca
1944 caaaggctgg cctgtgtgta agtcaaagtc actcccgcaa acctgaatct
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2044 ggtgatcagc tctttccaag ctcgtgcc
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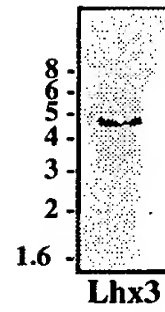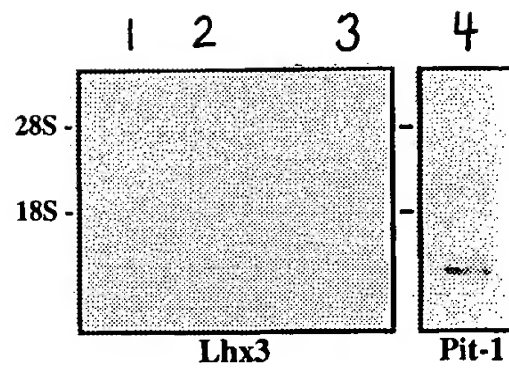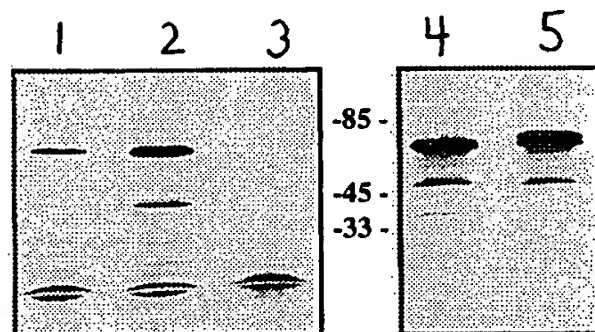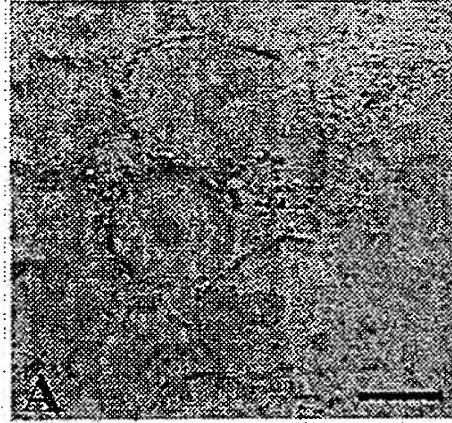
FIG. 12A

FIG. 12B

FIG. 12C

FIG.13A

FIG.13B
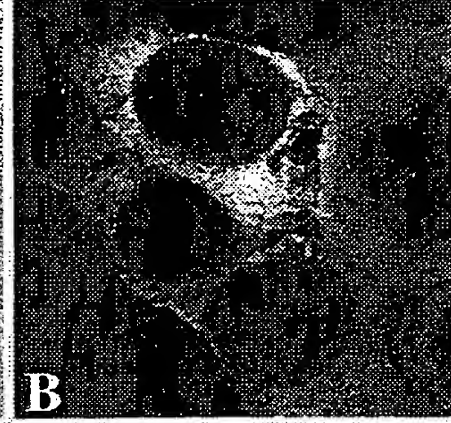

FIG.13C
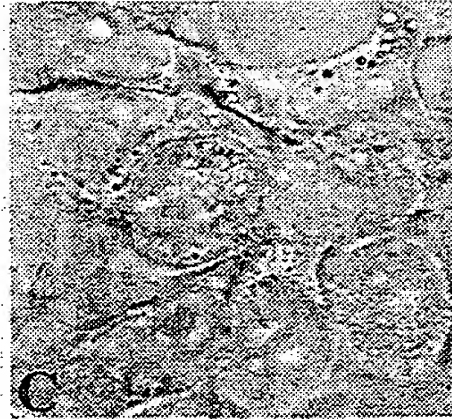
FIG.13D

FIG.13E

FIG.13F

FIG. 14Ai

FIG. 14Aii

FIG. 14B

FIG. 14C

FIG. I5Ai

αGSU PROMOTER

LUCIFERASE

-507   +46

CONTROL

hLhx3a

hLhx3b

hLhx3a-myc

hLhx3b-myc

0   500   1000   1500   2000   2500

LUCIFERASE ACTIVITY/μg PROTEIN $(\times 10^{-2})$

FIG. I5Aii

CONTROL   hLhx3a   hLhx3b

— 85

— 45

— 32.8
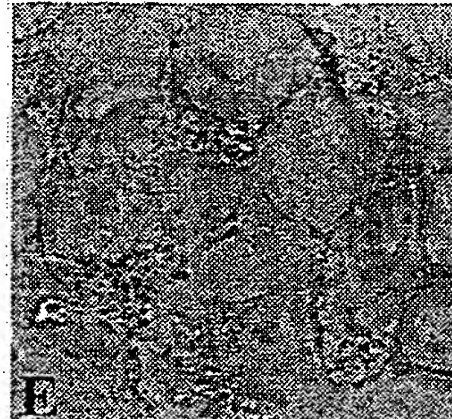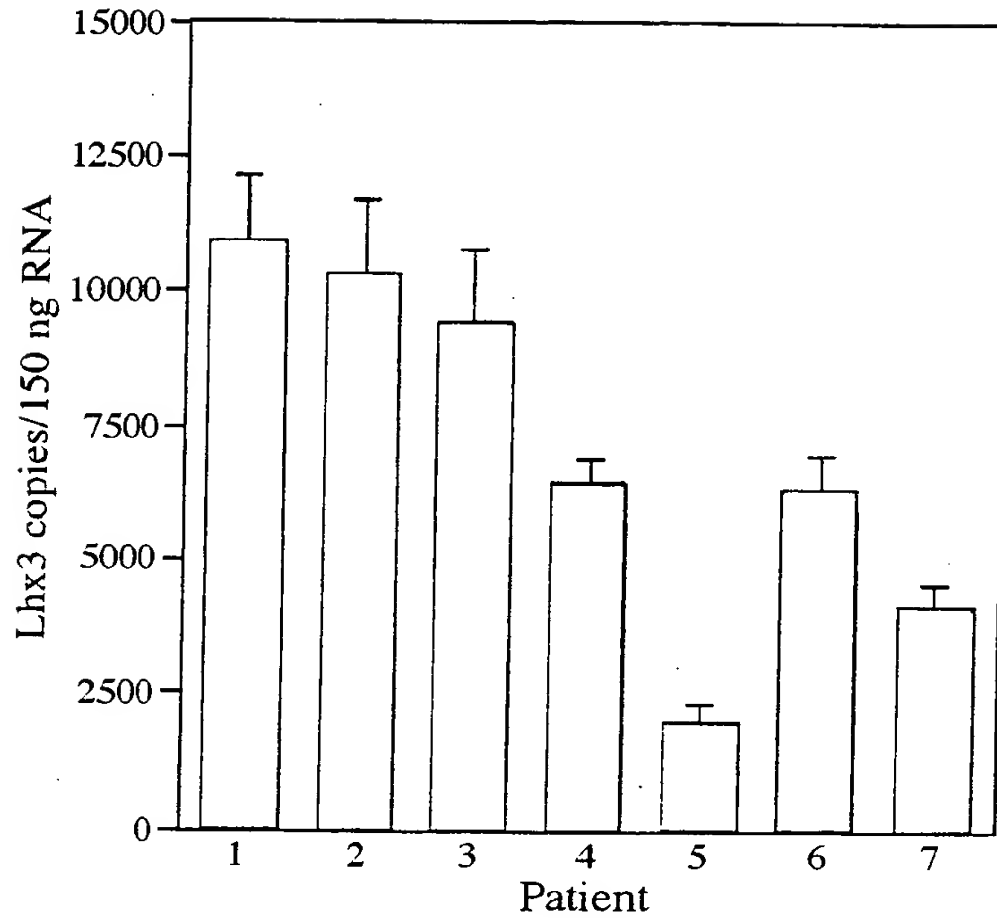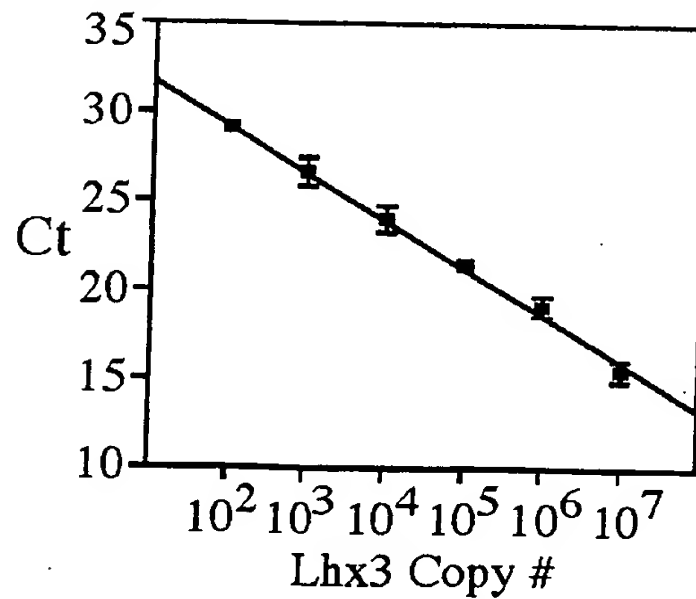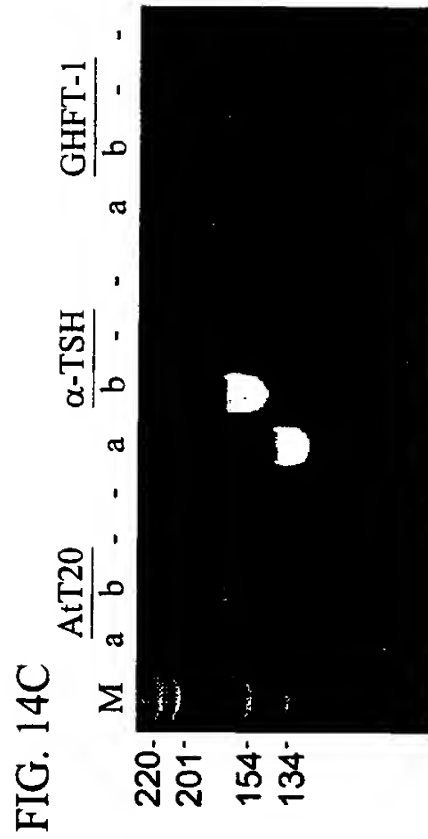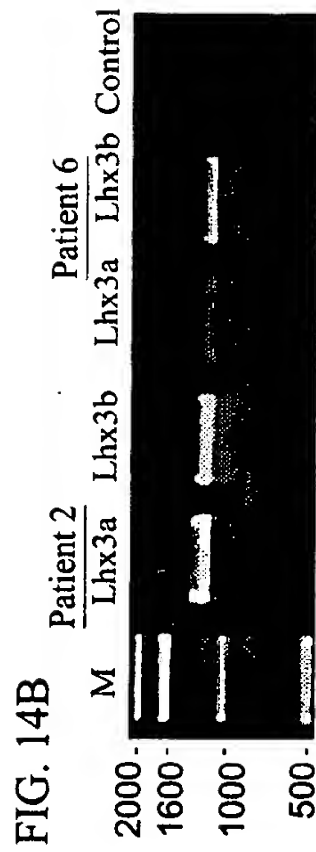
Fig. 15B

FIG. 16Ai

FIG. 16Aii

FIG. 16B

FIG. 17A

Lhx3 SITE

PRL -36

LUCIFERASE

CONTROL

hLhx3a

hLhx3b

hLhx3a-myc

hLhx3b-myc

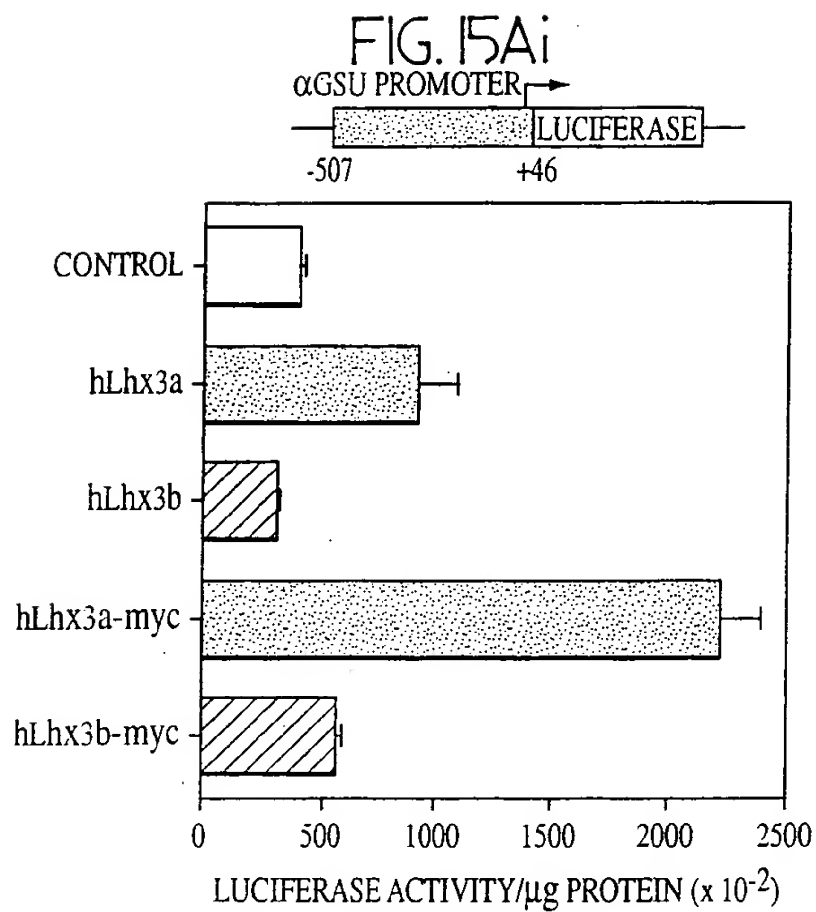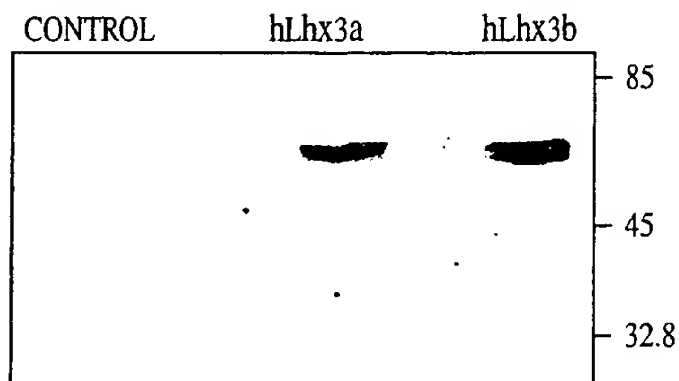0   500   1000   1500

LUCIFERASE ACTIVITY/μg PROTEIN
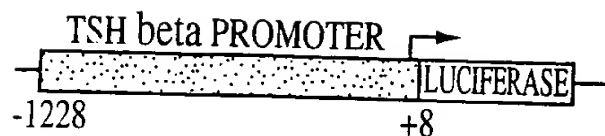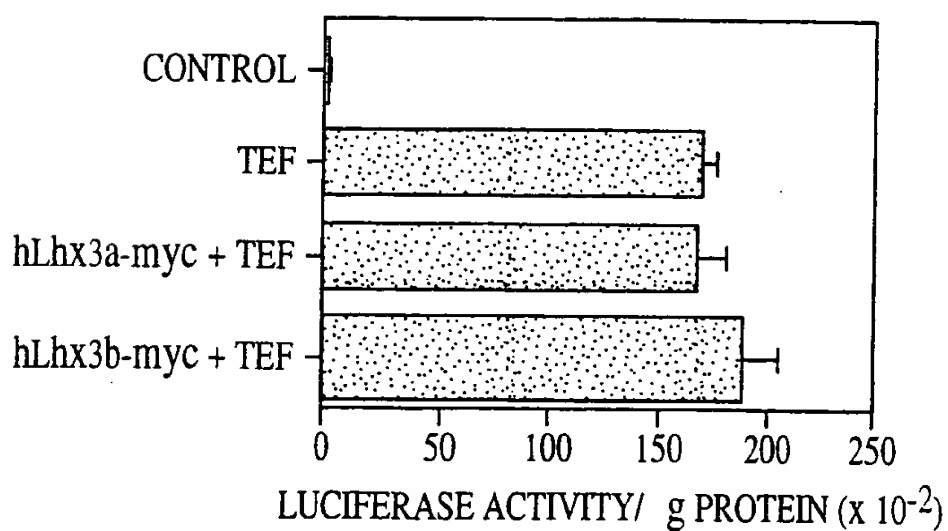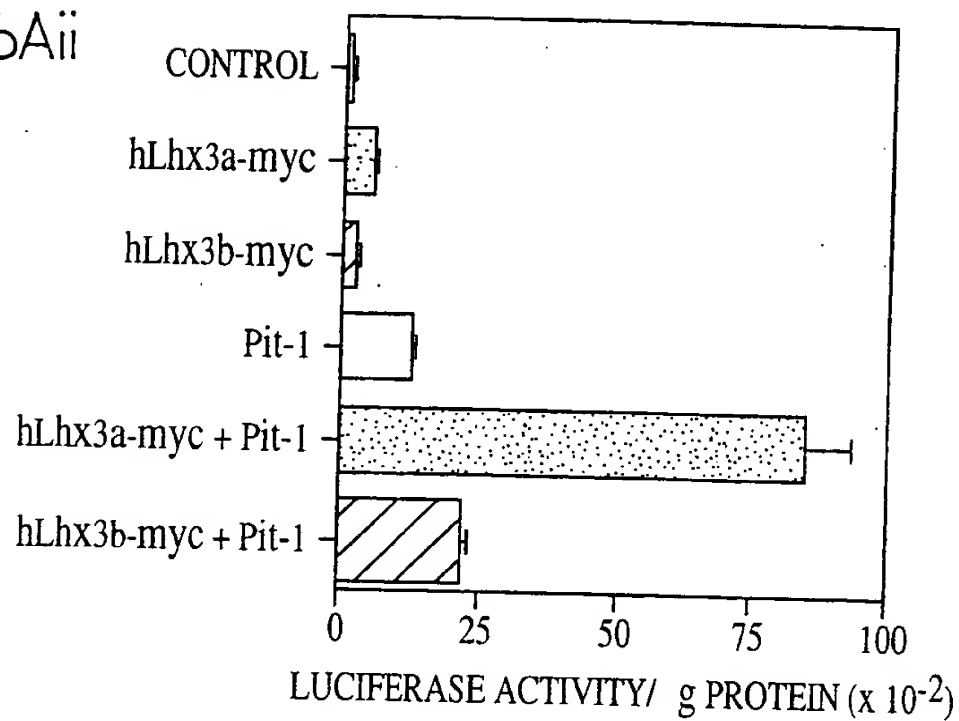
FIG. 17B
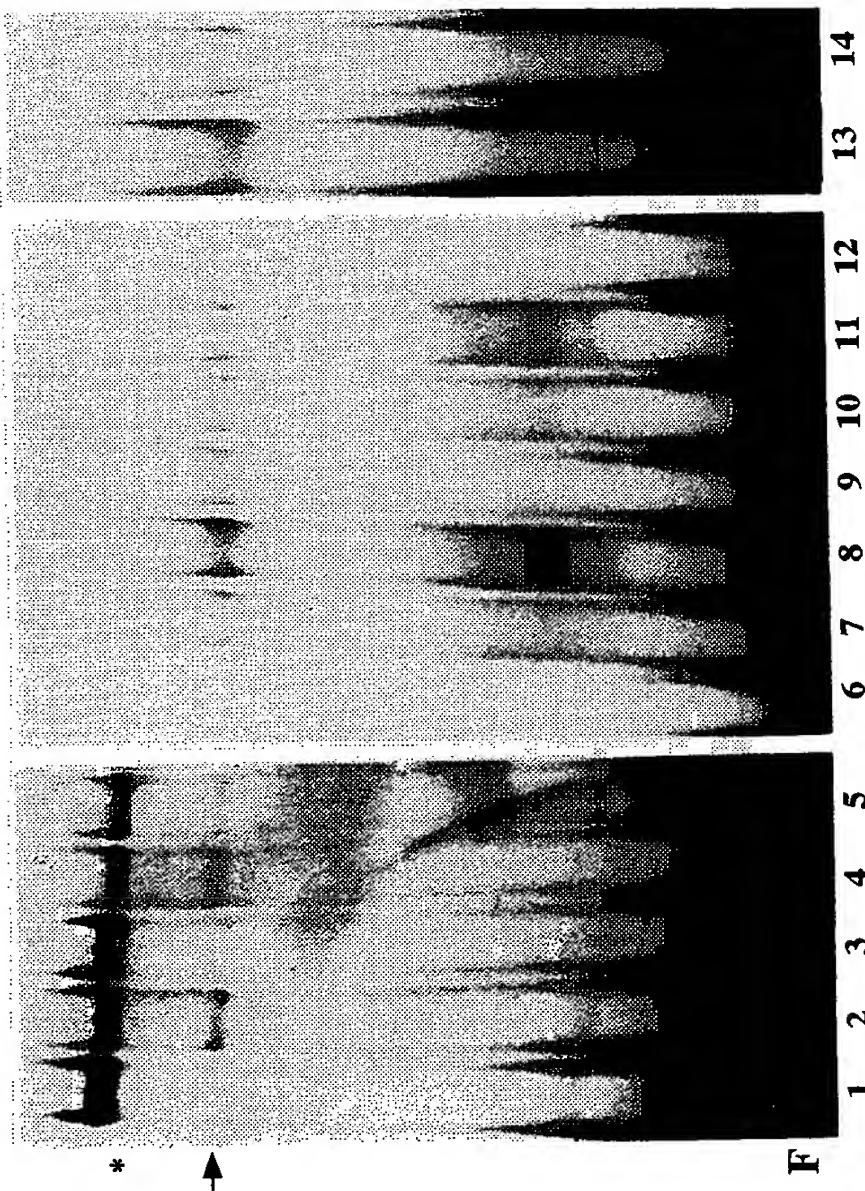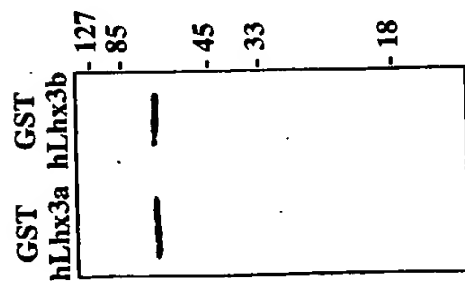
FIG. 18B

FIG.18A

FIG.19A

```
ttgatattta ccccgaggc ctgcagacag ggccaccagg aggggcagcc
acatttgcga ggagtccta taaagagtgg ccatgacgct taacatgaag
gagacccgat ggggtgcccc agctccagt gatggtgaag accgtttcc
ctatgtttcc tgccgggctt cagagagcag atccccctgg ggtggggttt
tcatttgagc tccacatgca cccttcttgg cactggcaac atttgtaat
tgagtattca gcctcgtgaa atggcctggg ctgctttctt gctcacacac
atttttagac cgatgtcagt ttcccctag ctcctgacat aggatgcggt
gcctgcacac tcccggaact tgcggggcca cttaagctgg ctggggaaga
gggtgtgtag ggaaaggagg acccctcggc ggccctgagt cctgtggcc
ggaggggagg ctggctcgcg ttggggtggg aaggtggctt cactgcctcc
tggtctacga ggtgacccag aacttcctcg tgcccaca GAGATCCC GCTGTGCGCT
GGCTGTGACC AGCACACATCCT ATCCTCAAGG CTCTGGACCG
CCACTGGCAC AGCAAGTGTC TCAAGTGCAG CGACTGCCAC ACGCCACTGG
CCGAGCGCTG CTTCAGCCGA GGGGAGAGCG TTTACTGCAA GGACGACTTT
TTCAAGCGCT TCGGGACCAA GTGCGCCGCG TGCCAGCTGG GCATCCCGCC
CACGCAGGTG GTGCGCCGCG CCCAGGACTT CGTGTACCAC CTGCACTGCT
TTGCCTGCGT CGTGTGCAAG CGGCACCTGG CCACGGGCGA CGAGTTCTAC
CTCATGGAGG ACAGCCGGCT CGTGTGCAAG GCGGACTACG AAACCGCCAA
```
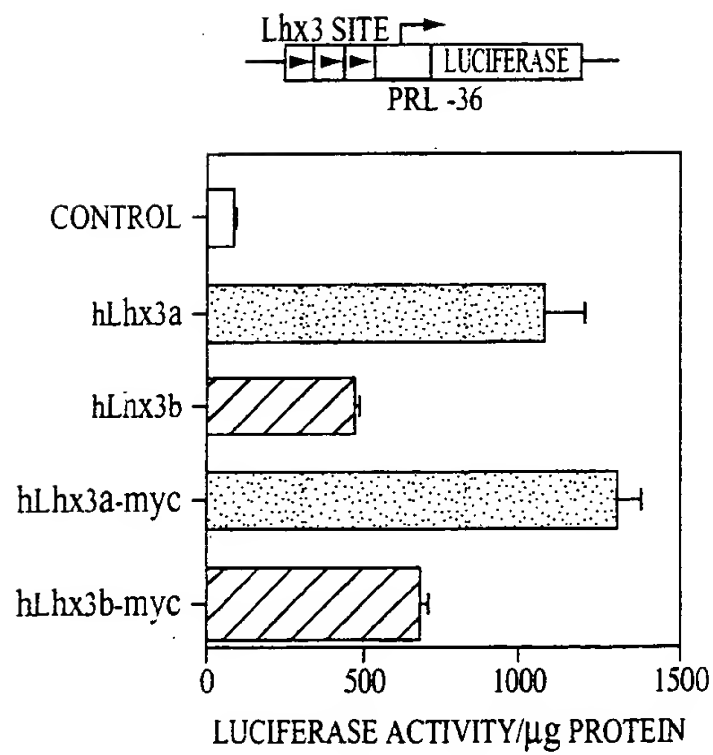
FIG. 19B

```
GCAGCGAGAG GCCGAGGCCA CGGCCAAGCG GCCGCGCACG ACCATCACCG
CCAAGCAGCT GGAGACGCTG AAGAGCGCTT ACAACACCTC GCCCAAGCCG
GCGCGCCACG TGCGCGAGCA GCTCTCGTCC GAGACGGGCC TGGACATGCG
CGTGGTGCAG GTTTGGTTCC AGAACCGCCG GGCCAAGGAG AAGAGGCTGA
AGAAGGACGC CGGCCGGCAG CGCTGGGGGC AGTATTTCCG CAACATGAAG
CGCTCCCGCG GCGGCTCCAA GTCGGACAAG GACAGCGTTC AGGAGGGGCA
GGACAGCGAC GCTGAGGTCT CCTTCCCCGA TGAGCCTTCC TTGGCGGAAA
TGGGCCCGGC CAATGGCCTC TACGGGAGCT TGGGGGAACC CACCCAGGCC
TTGGGCCGGC CCTCGGGAGC CCTGGGCAAC TTCTCCCTGG AGCATGGAGG
CCTGGCAGGC CCAGAGCAGT ACCGAGAGCT GCGTCCCGGC AGCCCCTACG
GTGTCCCCCC ATCCCCCGCC GCCCCGGTGTA CCCAGACACC AGCTTGGGCC
CTCCCTCTCCA GCCTGGTGTA CCCAGACACC AGCTTGGGCC TTGTGCCCTC
GGGAGCCCCC GGCGGGCCCC CACCCATGAG GGTGCTGGCA GGGAACGGAC
CCAGTTCTGA CCTATCCACG GGGAGCAGCG GGGGTTACCC CGACTTCCCT
GCCAGCCCCG CCTCCTGGCT GGATGAGGTA GACCACGCTC AGTTCTGACc
caggcccggc tccaccctgc acctcacacg agggagctgc cctgggtgg
gcggctcggg gctgctgggg tttccgagga agtggggcca gggcgtcaag
ggagggctgg tgccttcgga gcctcccact gccgaccgca cagctccctc
```

FIG. 19C

```
tctgggggct gaggaccca cctggcccct cctctgacac agggctggcc
cgccaggtgg cctcccagca agccagcctt ttttgtaagc aaatttctcc
cctttattga ccaattaact gagcacttgc tgctatttct agacatgaaa
tgtcaccttg ctgaggccca gcccagccca gcatagcccg agggctggaa
aaacgctttc atctctaaaa ctgagaaatc atcataattg tgctttcact
tcccaggctc catgtgtctt ggagccgtca ccccgaggct ccctctttag
gtcggagatt ggccttgcct gtcgaggcaa gaggctgcag aggcggggac
acacctgtgt cctcctcacc ccaccccagg ccctggtgt ccaggctgca
cccacagatg tctgttgcca aacagcctgc cctccctgcc ggagccggct
ctgccagccc cagattggga agtctccccg ctggagaagg gtgggctcc
tctgagcctg ccctgcctcc tccatcagat cctttgggaa gaagtttctg
ggagatgccc gcagctgtgc gtgcccaga cacaaaggct ggcctgtgtg
taagtcaaag tcactcccgc aaacctgaat ctcgagctac ctattggttc
tgtgaatgtt ctgtgtcttt tatttattct cgggtgatca gctctttcca
agctcgtgcc
```

FIG. 20A

```
gatcgcttcg gcagcagctg acactcagcc acctgcaccc agcacagccc
gcacacactt ggctttgcac ccgcgtgtcc ttgccctggc ccttcttggg
taacaagtgc tgtgcaaagt gaagggggcag aaagctggct gcatgggcca
ctgctcaaaa cggacacatc ggacctgctg ggagctagga gggagggact
gtggtttctt gtgccatcc ttctgggcct gggcccttaa agctcacagt
ccagaagcca taggcagagt ggacagagta ttgctgtgag accacaggg
agagggacct gcaggatggc atcagcccct ggtcccccaa cccttcctgt
gtgtttctgc gcactgccag ggcacccctg cctttgccaa gtcctgtgct
gccgagggcc acccactgct gtgttcttcc ccgggtggct gcccagggct
ggtgctggcc caggcccctc tgggcagggg tgggtgcgtc cctctgcctg
caaggacagg tgggttctgg agagctcacc tgtgtggact gggcaagag
gctgaaatat caGAGATCCC GCTGTGCGCT
GGCTGTGACC AGCACATCCT GGACCGCTTC ATCCTCAAGG CTCTGGACCG
CCACTGGCAC AGCAAGTGTC TCAAGTGCAG CGACTGCCAC AGGCCACTGG
CCGAGCGCTG CTTCAGCCGA GGGGAGAGCG TTTACTGCAA GGACGACTTT
TTCAAGCGCT TCGGGACCAA GTGCCGCGCG TGCCAGCTGG GCATCCCGCC
CACGCAGGTG GTGCGCCGCG CCCAGGACTT CGTGTACCAC CTGCACTGCT
TTGCCTGCGT CGTGTGCAAG CGGCACGGCTGG CCACGGGCGA CGAGTTCTAC
```

FIG. 20B

```
CTCATGGAGG ACAGCCGGCT CGTGTGCAAG GCGGACTACG AAACCGCCAA
GCAGGAGAG GCCGAGGCCA CGGCCAAGCG GCCGGCCACG ACCATCACCG
CCAAGCAGCT GGAGACGCTG AAGAGCGCTT ACAACACCTC GCCCAAGCCG
GCGGCCCACG TGCCGCGAGCA GCTCTCGTCC GAGACGGGCC TGGACATGCG
CGTGGTGCAG GTTTGGTTCC AGAACCGCCG GGCCAAGGAG AAGAGGCTGA
AGAAGGACGC CGGCCGGCAG CGCTGGGGGC AGTATTTCCG CAACATGAAG
CGCTCCCGCG GCGGCTCCAA GTCGGACAAG GACAGCGTTC AGGAGGGGCA
GGACAGGGAC GCTGAGGTCT CCTTCCCCGA TGAGCCTTCC TTGGCGGAAA
TGGGCCCGGC CAATGGCCTC TACGGGAGCT TGGGGAACC CACCCAGGCC
TTGGGCCGGC CCTCGGGAGC CCTGGGCAAC TTCTCCCTGG AGCATGGAGG
CCTGGCAGGC CCAGAGCAGT ACCGAGAGCT GCGTCCCGGC AGCCCCTACG
GTGTCCCCCC ATCCCCCGCC GCCCCGCAGA GCCTCCCTGG CCCCCAGCCC
CTCCTCTCCA GCCTGGTGTA CCCAGACACC AGCTTGGGCC TTGTGCCCTC
GGGAGCCCCC GGCGGGCCCC CACCCATGAG GGTGCTGGCA GGGAACGGAC
CCAGTTCTGA CCTATCCACG GGGAGCCAGCG GGGGTTACCC CGACTTCCCT
GCCCAGCCCCG CCTCCTGGCT GGATGAGGTA GACCACGCTC AGTTCTGACc
caggcccggc tccacctgc acctcacacg agggagctgc ccctgggtgg
gcggctcggg gctgctgggg tttccgagga agtggggcca gggcgtcaag
```

FIG.20C

ggaggctgg tgccttcgga gcctcccact gccgaccgca cagctccctc
tctggggct gaggacccca cctggcccct cctctgacac agggctggcc
cgccaggtgg cctcccagca agccagcctt ttttgtaagc aaatttctcc
cctttattga ccaattaact gagcacttgc tgctatttct agacatgaaa
tgtcaccttg ctgaggccca gcccagccca gcatagcccg agggctggaa
aaacgctttc atctctaaaa ctgagaaatc atcataattg tgctttcact
tcccagcctc catgtgtctt ggagccgtca cccgaggct ccctctttag
gtcggagatt ggccttgcct gtcgaggcaa gaggctgcag aggcggggac
acacctgtgt cctcctcacc ccaccccagg cccttggtgt ccaggctgca
cccacagatg tctgttgcca aacagcctgc cctccctgcc ggagccggct
ctgccagccc cagattggga agtctcccg ctggagaagg gtgggctcc
tctgagcctg ccctgcctcc tccatcagat cctttgggaa gaagtttctg
ggagatgccc gcagctgtgc gtgccccaga cacaaaggct ggcctgtgtg
taagtcaaag tcactcccgc aaacctgaat ctcgagctac ctattggttc
tgtgaatgtt ctgtgtcttt tatttattct cgggtgatca gctctttcca
agctcgtgcc

FIG.21A

```
gccccagtga gccctgggct ggaggtgatc acgcatgggg ctgccccggg
gcacggcctg ggcactgcct tccagaggct gcatgccaga agGAGATCCC GCTGTGCGCT
GGCTGTGACC AGCACATCCT GGACCGCTTC ATCCTCAAGG CTCTGGACCG
CCACTGGCAC AGCAAGTGTC TCAAGTGCAG CGACTGCCAC ACGCCACTGG
CCGAGCGCTG CTTCAGCCGA GGGGAGAGCG TTTACTGCAA GGACGACTTT
TTCAAGGCT TCGGGACCAA GTGCCGCGCG TGCCAGCTGG GCATCCCGCC
CACGCAGGTG GTGCGCCGCG CCCAGGACTT CGTGTACCAC CTGCACTGCT
TTGCCTGCGT CGTGTGCAAG CGGCAGCTGG CCACGGGCGA CGAGTTCTAC
CTCATGGAGG ACAGCCGGCT CGTGTGCAAG GCGGACTACG AAACGCCAA
GCAGCCGAGAG GCCGAGGCCA CGGCCAAGCG GCCGCGACG ACCATCACCG
CCAAGCAGCT GGAGACGCTG AAGAGGCGCTT ACAACACCTC GCCCAAGCCG
GCGCGCCACG TGCGCGAGCA GCTCTCGTCC GAGACGGGCC TGGACATGCG
CGTGGTGCAG GTTTGGTTCC AGAACCGCCG GGCCAAGGAG AAGAGGCTGA
AGAAGGACGC CGGCCGGCAG CGCTGGGGGC AGTATTTCCG CAACATGAAG
CGCTCCCGCG GCGGGCGCAA GTCGGACAAG GACAGCGTTC AGGAGGGGCA
GGACAGCGAC GCTGAGGTCT CCTTCCCCGA TGAGCCTTCC TTGGCGAAA
TGGGCCCGGC CAATGGCCTC TACGGGGAGCT TGGGGGAACC CACCCAGGCC
TTGGGGCCGGC CCTGGGGAGC CCTGGGCCAAC TTCTCCCTGG AGCATGGAGG
```

FIG. 21B

```
CCTGGCAGGC CCAGAGCAGT ACCGAGAGCT GCGTCCCGGC AGCCCCTACG
GTGTCCCCCC ATCCCCGCC GCCCCGCAGA GCCTCCCTGG CCCCAGCCC
CTCCTCTCCA GCCTGGTGTA CCAGACACC AGCTTGGGCC TTGTGCCCTC
GGGAGCCCCC GGCGGGCCCC CACCCATGAG GGTGCTGGCA GGGAACGGAC
CCAGTTCTGA CCTATCCACG GGGAGCAGCG GGGGTTACCC CGACTTCCCT
GCCAGCCCCG CCTCCTGGCT GGATGAGGTA GACCACGCTC AGTTCTGAcc
caggcccggc tccaccctgc acctcacacg agggagctgc cctgggtgg
gcggctcggg gctgctgggg tttccgagga agtggggcca gggcgtcaag
ggaggctgg tgccttcgga gcctcccact gccgaccgca cagctcccctc
tctgggggct gaggaccca cctgccccct cctctgacac agggctggcc
cgccaggtgg cctcccagca agccagcctt ttttgtaagc aaatttctcc
cctttattga ccaattaact gagcacttgc tgctatttct agacatgaaa
tgtcaccttg ctgaggccca gcccagccca gcatagcccg agggctggaa
aaacgctttc atctctaaaa ctgagaaatc atcataattg tgctttcact
tcccaggctc catgtgtctt ggagccgtca cccgaggct ccctctttag
gtcggagatt ggccttgcct gtcgaggcaa gaggctgcag aggcggggac
acacctgtgt cctcctcacc cacccagg cccttggtgt ccaggctgca
cccacagatg tctgttgcca aacagcctgc cctccctgcc ggagccggct
```

FIG. 21C

ctgccagccc cagattggga agtctccccg ctggagaagg gtggggctcc
tctgagcctg ccctgcctcc tccatcagat cctttgggaa gaagtttctg
ggagatgccc gcagctgtgc gtgcccagca cacaaaggct ggcctgtgtg
taagtcaaag tcactcccgc aaacctgaat ctcgagctac ctattggttc
tgtgaatgtt ctgtgtcttt tatttattct cgggtgatca gctctttcca
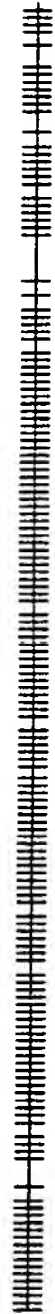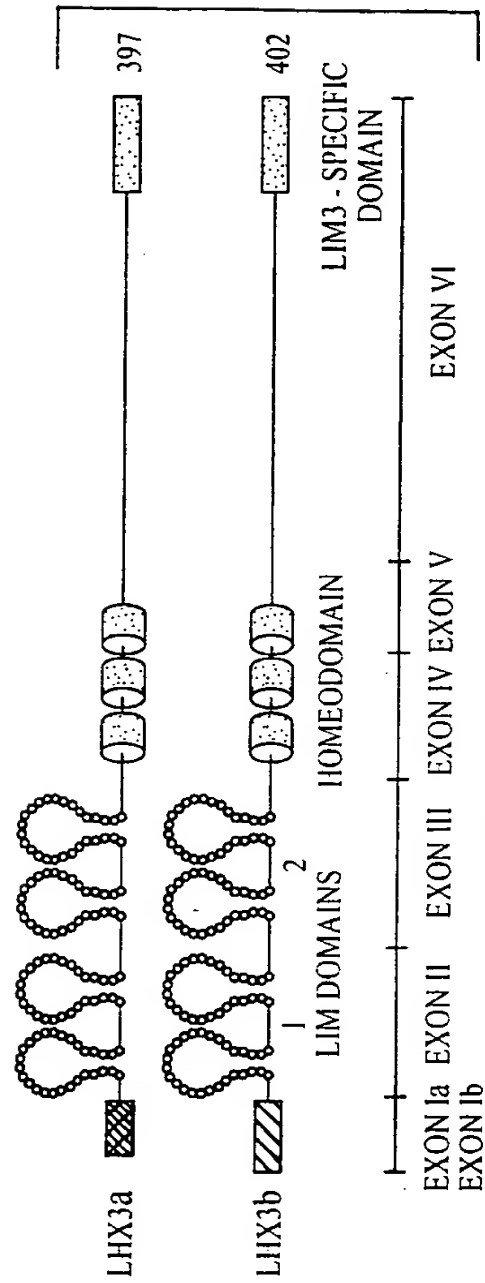agctcgtgcc

FIG. 22A

FIG. 22B

FIG. 22C

FIG.23A

FIG.23B

FIG.23C

9q34.3
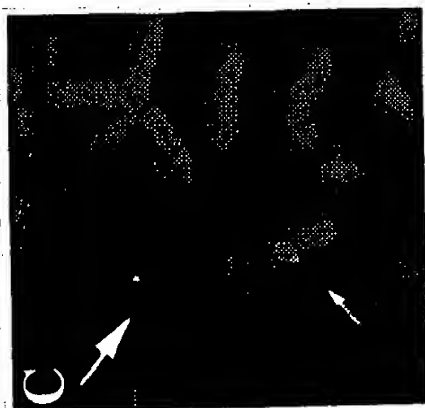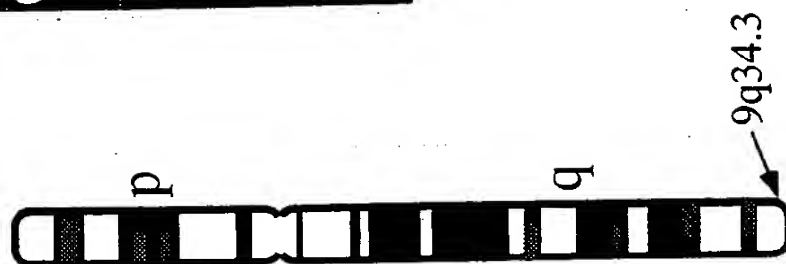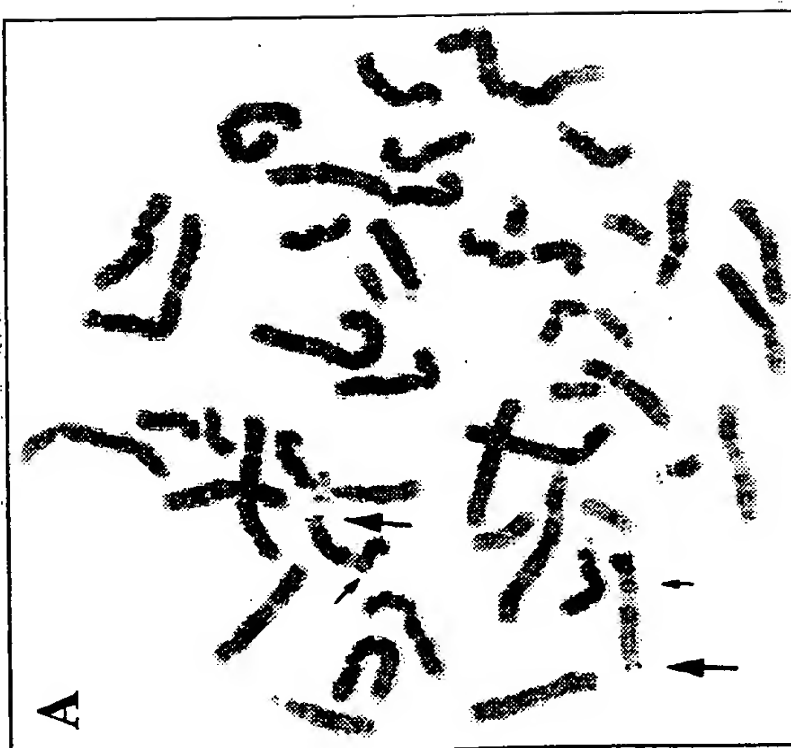
FIG.24

```
  1  MLLETGLERD RARPGAAAVC TLGGTR
 27  EIPLCAGCDQ HILDRFILKA LDRHWHSKCL KCSDCHTPLA ERCFSRGESV
 77  YCKDDFFKRF GTKCAACQLG IPPTQVVRRA QDFVYHLHCF ACVVCKRQLA
127  TGDEFYLMED SRLVCKADYE TAKQREAEAT AKRPRTTITA KQLETLKSAY
177  NTSPKPARHV REQLSSETGL DMRVVQVWFQ NRRAKEKRLK KDAGRQRWGQ
227  YFRNMKRSRG GSKSDKDSVQ EGQDSDAEVS FPDEPSLAEM GPANGLYGSL
277  GEPTQALGRP SGALGNFSLE HGGLAGPEQY RELRPGSPYG VPPSPAAPQS
327  LPGPQPLLSS LVYPDTSLGL VPSGAPGGPP PMRVLAGNGP SSDLSTGSSG
377  GYPDFPASPA SWLDEVDHAQ F*
```

FIG.25

```
  1  MEARGELGPA RESAGGDLLL ALLARRADLR R
 32  EIPLCAGCDQ HILDRFILKA LDRHWHSKCL KCSDCHTPLA ERCFSRGESV
 82  YCKDDFFKRF GTKCAACQLG IPPTQVVRRA QDFVYHLHCF ACVVCKRQLA
132  TGDEFYLMED SRLVCKADYE TAKQREAEAT AKRPRTTITA KQLETLKSAY
182  NTSPKPARHV REQLSSETGL DMRVVQVWFQ NRRAKEKRLK KDAGRQRWGQ
232  YFRNMKRSRG GSKSDKDSVQ EGQDSDAEVS FPDEPSLAEM GPANGLYGSL
282  GEPTQALGRP SGALGNFSLE HGGLAGPEQY RELRPGSPYG VPPSPAAPQS
332  LPGPQPLLSS LVYPDTSLGL VPSGAPGGPP PMRVLAGNGP SSDLSTGSSG
382  GYPDFPASPA SWLDEVDHAQ F*
```

FIG. 26A

```
   1 ggcacgagcc ccgcacgacg cggcgggact tgggagcccc gaaccctcca
  51 ggggacgctg acctcggagg agcgcgtctc gcgccactcg gcctggtggc
 101 cgcgATGCTG CTGGAAACGG GGCTCGAGCG CGACCGAGCG AGGCCCGGGG
 151 CCGCCGCCGT CTGCACCTTG GCGGGACTC GGGgtaagcc ccagcaggac
 201 actgaggaca gaaacggcaa gggcgcgcaga ggcgcgagga aggggtgcg
 251 tgcagggcca gcggccaggc aaagaaagtc ccgcgctct gcaggcggga
 301 cacagagatg gaaactgcag agagtgagtt tccagatccc agggtggcgg
 351 ggagggcctg acgctgccct gcaagagtgc gggacagcgg ttggagtgga
 401 ggcccctaga aaaaaagggg gcatcgcagg cacagctggg gggcgatggg
 451 gccgaccaag gggtgctagg ttccccggt gaccagtgcc cgtcagctct
 501 tgcacacagc ccggcccagg tctctggacc ccacagcagg ggaccccaagc
 551 cttgtgtctc ccgcctgaac caccctcccc aagggccatt ccatcaccac
 601 ggacgctggg aaataatgga ggcattgttg gagggctggc cagatgccag
 651 cagggtgggc cgcctcctta acctggcgcc gcccccttcc cagtcctgcc
 701 acacacgacc cctgatcgct tcggcagcag ctgacactca gccacctgca
 751 cccagcacag cccgcacaca ctcggctttg caccgcgtg tccttgccct
 801 ggcccttctt gggtaacaag tgctgtgcaa agtgaagggg cagaaagctg
 851 gctgcatggg ccactgctca aaacggacac atcggacctg ctgggagcta
 901 ggaggaggg actgtggttt cttgtgccca tccttctggg cctgggccct
```

FIG. 26B

```
 951 taaagctcac agtccagaag ccataggcag agtggacaga gtattgctgt
1001 gagacccaca gggagaggga cctgcaggat ggcatcagcc cctggtcccc
1051 caacccttcc tgtgtgtttc tgcgcactgc cagggcaccc ctgctttgcc
1101 aagtcctgtg ctgccgaggg ccacccactg ctgtgttctt ccccgggtgg
1151 ctgcccaggg ctggtgctgg cccaggccc tctgggcagg ggtgggtgcg
1201 tccctctgcc tgcaaggaca ggtgggttct ggagagctca cctgtgtgga
1251 ctggggcaag aggctgaaat atcaggtaag ggaccgtgtt ccaatggagc
1301 cggagtgctg ggggctggaa atggaaggtg tgccctgggg cttccccagc
1351 tcggcccctc acgacccgag gtcttggctg cgtgtccagg acacagagcc
1401 tgttctctct caaggattgc ccttcctccc tgagccgtcc gggccgcag
1451 ttccagggggt ggagcccaga agcctgttag catctgggat cggtccggca
1501 ccttgcggtt ccggtacgca gccctcggcg ccacactcac cccttctgcg
1551 tttcgggttg agctcccgcc gaccatctgc tgctcccgag gccaaacctc
1601 agcgcgggga ggaccctgct gccttctcga cccctctccc gggaacctta
1651 gccctcctgg cgtgtgctcc agctcaggcc tctgcctctg gccgctccg
1701 gcgcaggaag ctgcggggcc gggacgaacg ctggcgggaa gccctgacct
1751 gggccctccc ttaccggtgc ccgccctcgg gccgggcacg cggggcggcc
1801 tctggcgcacc gcaggtcccg gcgcaaaggc gctcagagtc cgcagtggcc
1851 cgggctggtc tccgcgaccc ccggcccccgc cccgcccccgc ggcccgccc
```

FIG. 26C

```
1901  cccggccgct ccgccctccg ctcggccaga ggctccggggc cccaggggcgg
1951  cccgcgggCg cagcgccag cagcacccgg agtcgcttgg acgccggttc
2001  ggggctattg cggggtggcg tcgctggccg cgggaaagtt cgggactgga
2051  gagtggcgac gccgggcggc gggacccATG GAGGCGCGCG GGGAGCTGGG
2101  CCCGGCCCGG GAGTCGCGGG GAGGCGACCT GCTGCTAGCA CTGCTGGCGC
2151  GGAGGGCAGA CCTGCGCCGA Ggtgggtgcc cgggccgagc ggctgcaccg
2201  gggagaccag gagatcctca ggcctttccg ggcctggccg cggaggctgg
2251  caggagctag aggatctggg cggggagtggg cgcgaggacc ccgaacgtc
2301  cgcgcctggg cgcctcagcc tgtatttgtt gcaggggcccc tggcctgggt
2351  tgtcaggggag tgagtgaggt tgtggcactg cgctgctccg gccagggagc
2401  tctcgggggt ccagggtggg cttaggagac ctctgcagcc cggagccagc
2451  tccctgggct ggaggaggcg caggggagcag tggcggggca gtgaccacgg
2501  gacaggaggg tccccaagaa ggccgcccca gccggactct ttccacgttc
2551  cagcggaaca gagtcagatg cagggccaa ggtcgagctg aactccgacc
2601  gtcggtctcc ccgaagccag gttcagcgt ctgcgcccac agacacccgc
2651  tcggtttatc ccgctcagg gccgtctgt aggaaaagc ctctcttctc
2701  caggcccccc agcttcctgg tggcaccact ctagctccca gcactttggt
2751  tcttagggaa cctgggcagt tctcctcgac tcccgggcca ggtggagccg
2801  caggatgggg aaggaggccc cggagccagt ggggagtgag aggaccggc
```

FIG. 26D

```
2851 cggcggaag gggt tacat ccaggctgtg gggctcgcg gttccctact
2901 tatttattta tttttcgacg gttcctggga ggggttggcc gcggggctg
2951 ggggcggag agaggaaggg aggaaggagg actgcgcc cgcgctcggg
3001 agagctggcc ggagcgggcg ggctgcgtc caggctccgc cgaccccgcc
3051 atccctgaca caggagcccc cgccagggct ggagtcgcca tgcagcgtaa
3101 ggctggggtc gcgggcgcgg cgcggggtgg gctggggcgg ctttgcccg
3151 acgcgggcgc cggcggcgag ctgcgccga ggcgctgtcc ggtccgcggt
3201 gctgaatccg cgctgtgtcg gcctgtcggg ccgccccgct ccgaccgggt
3251 cctcgcctgc gatcgctgcc cacgatgggg accccgggcg cgcagcgggt
3301 cctcgacgct ccgcaccccg agctgcggtt ttgccggatg cggggcgcat
3351 tcatcgccgg tttcccgcca ctgcgtgggg aggcgcagcc cagttttttc
3401 cgccggaggt cgagggagcc ccttcctggt gtctctcacc cactgggaga
3451 tgggctggag ccggcggggt ccacagccag ggaggcgggt gcaatatgtc
3501 agtaaatccc ggtcccttca gcggcactc ctctcttcca gagacttttt
3551 ctaagtgaag agggagtcct cagcccttga cacctggaaa acccgctcac
3601 agactcgagg ctcccacagg gcaccccttgg acctccccag tgtggttcct
3651 ccagggggcc tgcagtattg aagtgggggtg tggggggcag aagcagcggg
3701 aagccagacg tttgagtaac tctgncggtg ttggggcac ccacgcttga
3751 cacaaagcca gtggatgggt ttgtccagtc cactcataag taattttgcg
```

FIG. 26E

```
3801 gctgcccaat gatggggaag gcattgatat ttaccccgga ggcctgcaga
3851 cagggccacc aggcagggca gccacatttg cgaggagtcc ctagaaagag
3901 tggccatgac gcttaacatg aaggagaccc gatggggtgc cccagctcca
3951 ggtgatggtg aagacccgtt tccctatgtt tcctgccggg cttcagagag
4001 cagatcccct tggggtgggg tttcatttg agctccacat gcacccttct
4051 tggcactggc aacatttgt aattgagtat tcagcctcgt gaaatgcct
4101 gggctgcttt cttgctcaca cacatttta gaccgatgtc agttcccct
4151 tagctcctga cataggatgc ggtgcctgca cactcccgga acttgcgggg
4201 ccacttaagc tggctgggga agagggtgtg tagggaaagg aggaccctc
4251 ggcagccctg agtcctgtgg gccggagggg aggctggctc gcgttggggt
4301 gggaaggtgg cttcactgcc tcctggtcta cgaggtgacc cagaacttcc
4351 tcgtgcccac agAGATCCCG CTGTGCGCTG GCTGTGACCA GCACATCCTG
4401 GACCGCTTCA TCCTCAAGGC TCTGGACCGC CACTGCCACA GCAAGTGTCT
4451 CAAGTGCAGC GACTGCCACA CGCCACTGGC CGAGCGCTGC TTCAGCCGAG
4501 GGGAGAGCGT TTACTGCAAG GACGACTTTT TCAAgtgagc cccgaaacct
4551 cacctcagtg tgggagcgga gggcacgcct gcccaggga ctcctccct
4601 cacaatcacc aaggccaggc cctcgaagcc tgcgtctctc gcaatcccag
4651 cccactcctg tcaccaggc aggcaccct gcggcctggc caaattaagg
4701 gtggggcctc tccatgggtg ctccctgggt ggctgggcct ggctgggaca
```

FIG. 26F

```
4751  tcagcaagta ttatttcgaa aaaaaagcaa tttattacct aaatcacaga
4801  agcagtcatt agagaagata cacccctatt tgtaggattc tactggactt
4851  agttcctccg aaattggtga tgtttagtt cctaatgctg gcaccagcg
4901  gctctggccc agtgccttc atggctccag ctgtggggtg tgaggactg
4951  gccccagatg ggtcctctcc ctccggattc acctttcccag atccagcatg
5001  ggtcctgcag gcaatggcgg ctgggctccc cgaggtcttt ctgagattga
5051  ggttcccttc tcagtgggag tgggcagctc tgccccggcg gccaggctgg
5101  cgaccaccct gcaggggccgg acagagcctt cctccggggc cgccttccca
5151  ggcagccgct tgccgctctc caacccgctc ggggcgaaat gagcctgcg
5201  cttccgcgct gagcccggcc ctgtgcgtcc cgcagGCGCT TCGGACCAA
5251  GTGCGCGCG TGCCAGCTGG GCATCCCGCC CACGCAGGTG GTGCGCCGCG
5301  CCCAGGACTT CGTGTACCAC CTGCACTGCT TTGCCTGCGT CGTGTGCAAG
5351  CGGCAGCTGG CCACGGGCGA CGAGTTCTAC CTCATGGAGG ACAGCCGGCT
5401  CGTGTGCAAG GCGGACTACG AAACCGCCAA GCAGCGCGAGt cagccgaggg
5451  gacgacgctc ccacctttcc tggtctgaaa aaatgggggc tgaggccacg
5501  ctcaggggggg cgtccgggga aattctctcc ccaagcgctc actaaggggg
5551  cctgggctag ggcggtgtag gcagcaggaa gccgaggccg ggaacggcgg
5601  agtcacggac agacccgcgt cccgaaccgc ttcgttcggt ccgaagtgtg
5651  cggctttcg cccctggtcg gaattatcgc cctaaattct tggccgcgaa
```

FIG. 26G

```
5701 ggctgggcca tacccacacc cttagaataa aggggagccc gcggggaaat
5751 caggggtgctt ggagaaggga gccaaggctg aaggcggggg cgccgtggag
5801 gtgcgatttt agggaaggcg ccgcccccgc cccgcggca gaacccgccc
5851 tccgccggcg cccctccac cccagcccgg gtgctgcccg ttttgccaa
5901 tcgctcccag cgcccgcgcc ttccgagaag cctgtggggc gggatggggg
5951 tgggcacctg aggccccgac gtccccgcgc cggccgggt gggaggtgg
6001 gggtccggcc gggcccggag gggctgccgc gcctcaccgc tcgcccgccg
6051 cgcagAGGCC GAGGCCACGG CCAAGCGGCC GCGCACGACC ATCACCGCCA
6101 AGCAGCTGGA GACGCTGAAG AGCGCTTACA ACACCTCGCC CAAGCCGGCG
6151 CGCCACGTGC GCGAGCAGCT CTCGTCCGAG ACGGGCCTGG ACATGCGTGT
6201 GGTGCAGgtc agcgctcgcc cctgcttccc tcccgcccgc ggccttgggg
6251 gccccgcag agccggcgg ccgctcaccc cgccccgccc ccagGTTTGG
6301 TTCCAGAACC GCCGGCCAA GGAGAAGAGG CTGAAGAAGG ACGCCGGCCG
6351 GCAGGGCTGG GGGCAGTATT TCCGCAACAT GAAGGCTCC CGCGGCGGCT
6401 CCAAGTCGGA CAAGGACAGC GTTCAGGAGG GCAGGACAG CGACGCTGAG
6451 GTCTCCTTCC CCGtaggcg gagggatcgc ggagctcggg gggggacga
6501 gcgcggtcg gcgggtcgc aggggtccca gggagcccgc ggatctgaat
6551 ttcccatgga gttagtggac tccttaagtt ctactttcaa aagcatttca
6601 cttacagaac ctgctccccc agcaccctcc ccgcccctggg tggccactcc
```

FIG. 26H

```
6651 ggaccactgc tttcccctg gtggggacac aatccctgtg gccgacctg
6701 tcccaagct gggcgcctac gggcttctc atgggggggt gggcgtgtcc
6751 aggccgtctc tctgctcct agcccttgca gtgattttta ggagaatggg
6801 cagtgcattt cggaaagac tgagtcgaag tccagctgc ttggagttgg
6851 gggaggggc tacctgggt cagggagaga aggttccata cccttctgtg
6901 ggggctggat tatttattc attctccggg caccggggat gctgcgtccc
6951 catctgttga tgcccatcct cagaatgtgg acaagacact ctcttttggg
7001 ctgcctcgtg accggggcta ctcactcagc cactctggaa ctaaatatcc
7051 ttgtctgcaa aatgtgggtg gtggtatctg tgcccccttc ctaggctgct
7101 gtggggctgg tcctgaaagc ctggcccctg gctgggctgt tcctgactct
7151 gatcccacca ggcctgagac acctgggctg actcaggggt gagggcagtg
7201 gagggggcagg gacagccatg ctccaacagt agaaggggcc tgtgctgacc
7251 tgtcatgtgg tgtggggcag ccactctttc tctgacccag gggtgcctcc
7301 gcctgcagga tgggactctg aggggccgca ggtggagggc aggcgctgac
7351 tgagcctctg cttctgttgc agATGAGCCT TCCTTGGGCGG AAATGGGCC
7401 GGCCAATGGC CTCTACGGGA GCTTGGGGGA ACCCACCCAG GCCTTGGGCC
7451 GGCCCTCGGG AGCCCTGGGC AACTTCTCCC TGGAGCATGG AGGCCTGGCA
7501 GGCCCAGAGC AGTACCGAGA GCTGCGTCCC GGCAGCCCCT ACGGTGTCCC
```

FIG. 26I

```
7551  CCCATCCCCC GCCGCCCCGC AGAGCCTCCC TGGCCCCCAG CCCCTCCTCT
7601  CCAGCCTGGT GTACCCAGAC ACCAGCTTGG GCCTTGTGCC CTCGGGAGCC
7651  CCCGGCGGGC CCCCACCCAT GAGGGTGCTG GCAGGGAACG GACCCAGTTC
7701  TGACCTATCC ACGGGGAGCA GCGGGGGTTA CCCCGACTTC CCTGCCAGCC
7751  CCGCCTCCTG GCTGGATGAG GTAGACCACG CTCAGTTCTG Accaggccc
7801  ggctccaccc tgcacctcac acgagggagc tgcccctggg tgggcggctc
7851  ggggctgctg gggttccga ggaagtgggg ccagggcgtc aagggagggc
7901  tggtgccttc ggagcctccc actgccgacc gcacagctcc ctctctgggg
7951  gctgagggac ccacctggcc cctcctctga cacagggctg gccgccagg
8001  tggcctccca gcaagccagc cttttttgta agcaaatttc tcccctttat
8051  tgaccaatta actgagcact tgctgctatt tctagacatg aaatgtcacc
8101  ttgctgaggc ccagcccagc ccagcatagc ccgagggctg gaaaacgct
8151  ttcatctcta aaactgagaa atcatcataa ttgtgctttc acttcccagg
8201  ctccatgtgt cttggagccg tcaccccgag gctccctctt taggtcggag
8251  attggccttg cctgtcgagg caagaggctg cagaggcggg gacacacctg
8301  tgtcttccgg gagaggcccc ctcctctccc cagaccacacag gggcctctc
8351  tgcctccagc cccaccttcc ccgggagaag cttccccaa tccccagtc
8401  tctagatcat tctgttctcg agtatcctgt ggaggaggca aaaatgcctg
```

FIG.26J

8451 gcgcccttc tctccaagct caattctcta agcccctcag ggtcctcc

8501 tcacccacc ccagcccctt ggtgtccagg ctgcacccac agatgtctgt

8551 tgccaaacag cctgccctcc ctgccggagc cggtctctgcc agcccagat

8601 tgggaagtct cccgctgga gaaggtgggg gctcctctga gctgccctg

8651 cctctccat cagatcctt gggaagaagt ttctgggaga tgcccgcagc

8701 tgtgcgtgcc ccagacacaa aggctggcct gtgtgtaagt caaagtcact

8751 cccgcaaacc tgaatctcga gctacctatt ggttctgtga atgttctgtg

8801 tcttttattt attctcgggt gatcagctct ttccaagact tcaaaaaant

8851 gtcagttacc tcgtgcc

FIG.27A

1 atgctgctgg aaacggagct ggcgggcgac cgagatcggc ccgggccccc

51 cgcagccgcc gctgtctgca ccttacccgg gactcgggag atcccactgt

101 gtgccggctg cgaccagcac atcctggacc gcttcatcct caaggctctg

151 gaccgccact ggcacagcaa gtgcctcaag tgcagtgact gccacacgcc

201 gctggccgag cgctgcttca gccgcgggga gagcctctac tgcaaggacg

251 acttcttcaa gcgcttcggg accaagtgcg ccgcgtgcca gctgggcatc

301 ccgcccacgc aggtggtgcg ccgcgcccag gacttcgtgt accacctgca

FIG. 27B

```
 351 ctgcttcgcc tgcgtcgtgt gcaagcggca gctggccacg ggcgacgagt
 401 tctacctcat ggaggacagc cggctcgtgt gcaaggccga ctacgagacc
 451 gccaagcagc gagaggccga ggccacggcc aagcggccgc gcacgaccat
 501 cacggccaag cagctggaga cgctgaagag cgcctacaac acgtcgccca
 551 agcccgcgcg ccacgtgcgc gagcagctct cctccgagac cggcctggac
 601 atgcgcgtcg tgcaggtgtg gttccagaac cgccggccca aggaaaagcg
 651 gctcaagaag gacgccggcc ggcagcgctg gggccagtac ttcgtaaca
 701 tgaagcgcgc ccgcggtggc tccaagtcgg acaaggacag cgtccaggag
 751 gaggggcagg acagtgacgc cgaggtctcc ttcacagacg agccatccat
 801 ggccgaaatg ggccctgcca acggcctcta cgcgcctg ggggagcctg
 851 cccctgcctt ggggccggcc tcggggccc cgggcagctt cccgctggag
 901 cacggaggcc tggcgggccc ggagcagtat ggagagctgc gccccagcag
 951 ccctacggt gtcccctcgt cgcccgccgc cctgcagagc ctccctggcc
1001 cccagcccct cctctccagc ttggtgtacc cggaggctgg cttggggctt
1051 gtgcccgcgg ggccccagg tgggcccca cccatgaggg tgctggcagg
1101 gaacggaccc agctccgacc tatccacggg gagcagtggg ggctacccg
1151 acttccctgc cagtcccgcc tcctggctgg acgaggtgga tcacgctcag
1201 ttctgactga ggccccagct ccgtggagca ccagacacga gcactgcccc
```

FIG.27C

```
1251 tggctgggtg gtcgggagcc gcgctctcct ttcccgaagc cctgggcctc
1301 taaaggacac agggtcaccg gcggggcaca ggctgaggac tgtccagccc
1351 ggcggccctg gccccgggca gaggacttt  ctcccggtct cgaggctcct
1401 tctgggacaa ggggagccac ctggtggctg ctcagcaagc cttgtttttgt
1451 aagcagattc ctccctttat caaccaaaat taactgagtg cttgctgctc
1501 tttctagacc ggagtggtca gcccccgaag ccggggaggg gggctctccc
1551 cagcccagag cagcacagcc ctcagactgg aagatgcttt aattttaaa
1601 attaaaaaat aatacgaact gtgcttccat ttcccagctt cctctgtcta
1651 gttctgcc
```

FIG.28

```
  1 MLLETELAGD RDRPGAPAAA AVCTLPGTRE IPLCAGCDQH ILDRFILKAL
 51 DRHWHSKCLK CSDCHTPLAE RCFSRGESLY CKDDFFKRFG TKCAACQLGI
101 PPTQVVRRAQ DFVYHLHCFA CVVCKRQLAT GDEFYLMEDS RLVCKADYET
151 AKQREAEATA KRPRTTITAK QLETLKSAYN TSPKPARHVR EQLSSETGLD
201 MRVVQVWFQN RRAKEKRLKK DAGRQRWGQY FRNMKRARGG SKSDKDSVQE
251 EGQDSDAEVS FTDEPSMAEM GPANGLYGGL GEPAPALGRP SGAPGSFPLE
301 HGGLAGPEQY GELRPSSPYG VPSSPAALQS LPGPQPLLSS LVYPEAGLGL
351 VPAGPPGPP PMRVLAGNGP SSDLSTGSSG GYPDFPASPA SWLDEVDHAQ
401 F
```

FIG. 29A

```
  1 atggaagcgc gcggggagct gggccccagc cgggagtcgg cgggcgggcga
 51 cctgctgctg gcgctgctgg cgcggaggga ggacctgcgc cgagagatcc
101 cactgtgtgc cggctgcgac cagcacatcc tggaccgctt catcctcaag
151 gctctggacc gccactggca cagcaagtgc ctcaagtgca gtgactgcca
201 cacgcggctg gccgagcgct gcttcagccg cggagagagc ctctactgca
251 aggacgactt cttcaagcgc ttcggaccca agtgccgccg cgtgccagctg
301 ggcatcccgc ccacgcaggt ggtgccgccg cgcccaggact tcgtgtacca
351 cctgcactgc ttcgcctgcg tcgtgtgcaa gcggcgcagct gccacgggcg
401 acgagttcta cctcatggag gacagccggc tcgtgtgcaa ggccgactac
451 gagaccgcca agcagcgaga ggccgaggcc acggccaagc ggcgcgcac
501 gaccatcacg gccaagcagc tggagacgct gaagagcgcc tacaacacgt
551 cgcccaagcc cgcgcgccac cgtgcgcgagc agctctcctc cgagaccggc
601 ctggacatgc gcgtcgtgca ggtgtgttc cagaaccgcc gggccaagga
651 aaagcggctc aagaaggacg ccggccggca cggctggggc cagtactttc
701 gtaacatgaa gcgcgccgc ggtgctcca agtcggacaa ggacagcgtc
751 caggaggagg ggcaggacag tgacgccgag gtctccttca cagacgagcc
801 atccatggcc gaaatgggcc ctgccaacgg cctctacgcc ggcctgggggg
851 agcctgcccc tgccttgggc cggccctcgg gggcccgg cagcttcccg
```

FIG. 29B

```
 901 ctggagcacg gaggcctggc gggcccggag cagtatggag agctgcgccc
 951 cagcagcccc tacggtgtcc cctcgtcgcc cgccgccctg cagagcctcc
1001 ctggccccca gcccctcctc tccagcttgg tgtacccgga ggctggcttg
1051 gggcttgtgc ccgcggggcc cccaggtggg cccccaccca tgagggtgct
1101 ggcagggaac ggacccagct ccgacctatc cacggggagc agtggggct
1151 accccgactt ccctgccagt cccgcctcct ggctggacga ggtgatcac
1201 gctcagttct gactgaggcc ccagctccgt ggagcaccag acacgagcac
1251 tgcccctggc tgggtggtcg ggagccggcg tctcctttcc cgaagccctg
1301 ggcctctaaa ggacacaggg tcaccggcgg ggcacaggct gaggactgtc
1351 cagcccggcg gccctggccc cgggcagagg gactttctcc cggtctcgag
1401 gctcctttctg ggacaagggg agccacctgg tggctgctca gcaagccttg
1451 ttttgtaagc agattcctcc ctttatcaac caaaattaac tgagtgcttg
1501 ctgctctttc tagaccggag tggtcagccc ccgaagccgg ggaggggggc
1551 tctcccagc ccagagcagc acagccctca gactggaaga tgctttaatt
1601 tttaaatta aaaaataata cgaactgtgc ttccatttcc cagcttcctc
1651 tgtctagttc tgcc
```

FIG. 30

```
  1 MEARGELGPS RESAGGDLLL ALLARREDLR REIPLCAGCD QHILDRFILK
 51 ALDRHWHSKC LKCSDCHTPL AERCFSRGES LYCKDFFKR FGTKCAACQL
101 GIPPTQVVRR AQDFVYHLHC FACVVCKRQL ATGDEFYLME DSRLVCKADY
151 ETAKQREAEA TAKRPRTTIT AKQLETLKSA YNTSPKPARH VREQLSSETG
201 LDMRVVQVWF QNRRAKEKRL KKDAGRQRWG QYFRNMKRAR GGSKSDKDSV
251 QEEGQDSDAE VSFTDEPSMA EMGPANGLYG GLGEPAPALG RPSGAPGSFP
301 LEHGGLAGPE QYGELRPSSP YGVPSSPAAL QSLPGPQPLL SSLVYPEAGL
351 GLVPAGPPGG PPPMRVLAGN GPSSDLSTGS SGGYPDFPAS PASWLDEVDH
401 AQF
```